5.9 Paleontological Resources

Information contained in this section is summarized from the paleontological resources technical report, *Technical Report Paleontological Resource Assessment Dos Colinas West Senior Living City of Carlsbad, San Diego County California (APN 209-060-68 and APN 209-060-70)*, prepared by Department of Paleoservices, San Diego Natural History Museum, January 28, 2009. This document is provided as Appendix H on the attached CD of Technical Appendices found on the back cover of this EIR.

5.9.1 Existing Conditions

Paleontological resources (i.e., fossils) are the remains and/or traces of prehistoric (i.e., 10,000 years or older) plant and animal life exclusive of humans. Fossil remains are found in the geologic deposits within which they were originally buried. Therefore, by knowing the geology of a particular area and the fossil productivity of formations that occur in that area, it is possible to predict where fossils will, or will not be encountered.

CCRC Site and Affordable Housing Site

The project site (CCRC site, including the RV storage/garden area and affordable housing site) overlies Holocene-age alluvium and colluvium, with minor occurrences of artificial fill and landslide debris, Pleistocene-age terrace deposits (correlative with the Bay Point Formation), and Eocene-age sedimentary rocks of the Santiago Formation. The alluvium and colluvium do not have any potential for yielding significant fossils. Both the Bay Point Formation and Santiago Formation have yielded very important and well-preserved fossil remains (San Diego Natural History Museum collection records) and are assigned a high paleontological resource sensitivity rating by Deméré and Walsh, 1993.

Fossils locally occur in the Pleistocene terrace deposits exposed in Carlsbad and Oceanside and primarily consist of well-preserved shells and tests of nearshore marine invertebrates (e.g., clams, oysters, scallops, snails, crabs, sea urchins, and sand dollars). Sparse remains of marine vertebrates (e.g., sharks, rays, and bony fish) have also been recovered from these deposits. These fossils are significant and serve to document the location and faunal composition of Pleistocene marine paleoenvironments in northern San Diego County. The geologic age of these deposits ranges from approximately 120,000 to 300,000 years old.

Northwest of the project site, at the Robertson Ranch property, Pleistocene terrace deposits yielded many fossil specimens, including aquatic plants (e.g., seagrass), estuarine invertebrates (e.g., clams, snails, and crabs), freshwater invertebrates (e.g., snails and ostracods), estuarine vertebrates (e.g., sharks, rays, and bony fish), and terrestrial vertebrates (e.g., amphibians, pond turtle, lizard, snake, birds, rabbit, rodents, ground sloth, horse, tapir, camel, deer, bison, and mastodon). In addition, construction activities at the Terraces at Sunny Creek residential project to the south of the Dos Colinas project site produced important land mammal fossils (e.g., horse and mammoth) from correlative Pleistocene terrace deposits.

Fossils locally occur in the Santiago Formation exposed in Carlsbad and Oceanside and consist of well-preserved shells of marine and estuarine invertebrates (e.g., clams, oysters, snails, and crabs), as well as remains of marine vertebrates (e.g., sharks, rays, bony fish, and crocodiles). Also recovered from the

Santiago Formation are well-preserved skeletal remains of terrestrial vertebrates (e.g., tortoise, lizard, snake, birds, opossums, hedgehogs, bats, primates, rodents, tapir, horse, brontothere, and protoredon).

Because of these previous records, and following the paleontological guidelines developed by the County of San Diego, the Pleistocene terrace deposits and Santiago Formation underlying the project site are assigned a high paleontological resource sensitivity rating.

5.9.2 Threshold For Determining Significance

Appendix G of the CEQA Guidelines is used to provide direction for the determination of a significant paleontological resources impact from the proposed project. For purposes of this EIR a significant impact will occur if the proposed project:

- *Directly or indirectly destroys a unique paleontological resource or site.*

5.9.3 Environmental Impact

Paleontological resources are typically impacted when earthwork activities cut into geological deposits (formations) within which fossils are buried. The impact is in the form of the physical destruction of fossil remains. Since fossils are the remains of prehistoric animal and plant life, they are considered to be non-renewable. Such an impact is significant, and under CEQA Guidelines, requires mitigation.

CCRC Site, RV Storage/Garden, and Affordable Housing Site

Implementation of the proposed project (at the CCRC site, RV storage/garden site, and the affordable housing site) will require earthwork that will occur within Quaternary (Pleistocene terrace deposits) and Tertiary (Santiago Formation) deposits, including the Santiago Formation. These formations have a high paleontological resource sensitivity. Because the proposed project will disturb geological formations that have a high sensitivity, the potential impact to paleontological resources is considered significant.

In order to mitigate for the potential impact to potentially important fossil deposits, a paleontologist will be required to monitor any grading or trenching that will intrude into the Quaternary and Tertiary age deposits underlying the project site. In the event that fossils are discovered, a recovery plan will need to be implemented to remove the fossils for study and preservation. Mitigation Measure PR-1, discussed below, requires paleontological monitoring of any earthwork onsite and the recovery of any important paleontological resources if discovered onsite during grading. Implementation of Mitigation Measure PR-1 will reduce the potentially significant impact to paleontological resources to a level less than significant.

5.9.4 Mitigation Measures

CCRC Site and Affordable Housing Site

PR-1 Prior to project site grading for all phases of development for the CCRC site, RV/Storage Garden area, or affordable housing site, a qualified paleontologist shall be retained to carry out an appropriate mitigation program. A qualified paleontologist is defined as an individual with an M.S. or Ph.D. in paleontology or geology who is familiar with paleontology procedures and techniques.

- The qualified paleontologist shall be present at the pre-construction meeting to consult with grading and excavation contractors concerning excavation schedules, paleontological field techniques, and safety issues.
- A paleontological monitor shall be onsite on a full-time basis during the original cutting of previously undisturbed deposits of high paleontological resource potential (Pleistocene Terrace Deposits and Santiago Formation) to inspect exposures for contained fossils. A paleontological monitor is defined as an individual who has experience in the collection and salvage of fossil materials. The paleontological monitor should work under the direction of a qualified paleontologist.
- When fossils are discovered the paleontologist (or paleontological monitor) shall recover them. In most cases, this fossil salvage can be completed in a short period of time. However, some fossil specimens (such as a complete large mammal skeleton) may require an extended salvage period. In these instances the paleontologist (or paleontological monitor) shall be allowed to temporarily direct, divert, or halt grading to allow recovery of fossil remains in a timely manner. Because of the potential for the recovery of small fossil remains, such as isolated mammal teeth, it may be necessary in certain instances, to set up a screen-washing operation on the site.
- Fossil remains collected during the monitoring and salvage portion of the paleontological mitigation program shall be cleaned, repaired, sorted, and cataloged.
- Prepared fossils, along with copies of all pertinent field notes, photos, and maps, shall be deposited (as a donation) in a scientific institution with permanent paleontological collections such as the San Diego Natural History Museum. Donation of the fossils shall be accompanied by financial support for initial specimen storage.
- A final paleontological monitoring and recovery (if applicable) summary report shall be completed that outlines the results of the mitigation program. This report shall include discussions of the methods used, stratigraphic section(s) exposed, fossils collected, and significance of recovered fossils.

5.9.5 Impact After Mitigation

Grading required for project implementation has the potential to result in a significant impact to paleontological resources. Implementation of Mitigation Measure PR-1 will reduce the potential paleontological resources impact to a level less than significant.

This page intentionally left blank.